

CONTACT POINTS

Kent H. Casleton

Physical Scientist

304-285-4573

kent.casleton@netl.doe.gov

Daniel J. Maloney

Physical Scientist

304-285-4629

daniel.maloney@netl.doe.gov

Diane (DeeDee) Newlon

Technology Transfer Manager

304-285-4086

r diane.newlon@netl.doe.gov

ADDRESS

National Energy Technology Laboratory

3610 Collins Ferry Road
P.O. Box 880
Morgantown, WV 26507-0880
304-285-4469 fax

626 Cochran's Mill Road
P.O. Box 10940
Pittsburgh, PA 15236-0940
412-386-4604 fax

WEBSITE

www.netl.doe.gov/products/r&d



LOW EMISSIONS COMBUSTOR TEST AND RESEARCH FACILITY

Capabilities

The Low Emissions Combustor Test and Research (LECTR) Facility at the National Energy Technology Laboratory (NETL) offers test facilities and engineering support to NETL customers interested in evaluating emissions characteristics and operating performance of new combustion concepts at elevated pressures through programs such as the University-Industry Consortia and through CRADA participation with industrial partners.

The LECTR is a versatile test facility with capabilities for evaluating a variety of low emissions combustion concepts at temperatures and pressures representative of gas turbine applications. This facility utilizes the full range of high pressure (up to 30 atm), high temperature (800 K/1000 °F air preheat, 2100 K/3300 °F combustor wall), and mass flows (3.2 lb/s combustion air) available in NETL's Advanced Combustion Facility. The LECTR design incorporates a set of flanged modules including an inlet plenum, combustor test sections, a gas sampling section, and a quench section. Combustor test sections can be custom designed to meet a specific application by varying the internal refractory dimensions. This modular design approach offers the flexibility to test multiple concepts with rapid turnaround thus maximizing operating time while reducing the time and cost associated with building new inlet, sampling, and quench systems for each application. The high pressure and mass flow capabilities of the LECTR facility make it uniquely suited for evaluation of advanced combustion concepts at combustion scales up to 3 MWth (10 MMBtu/h).

In addition to these experimental facilities, NETL also has modeling and analytical (computational) capabilities that include Fluent, a computational fluid dynamics code, and the Chemkin family of detailed chemical kinetics codes. NETL invites inquiries and collaboration on the application of these detailed analysis methods to study research and commercial scale combustion hardware.

Diagnostic Capabilities

- Multiple optical and probe access ports
- Laser-based diagnostics for flow visualization, velocity, and species measurement
- Video and high-speed imaging capabilities
- Radiation pyrometry
- Extractive gas sampling with a full complement of associated gas analyzers

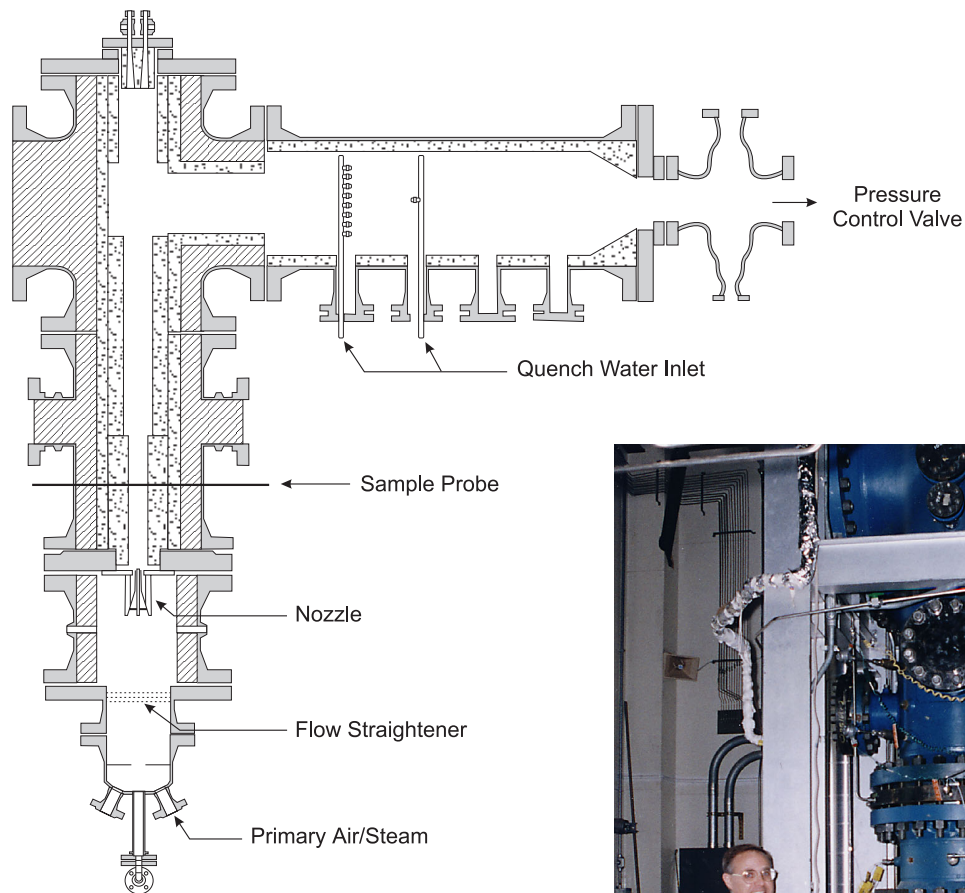
LOW EMISSIONS COMBUSTOR TEST AND RESEARCH FACILITY

Diagnostic Capabilities (continued)

The LECTR has recently been utilized to characterize the operating and emissions characteristics of a porous surface-stabilized burner for potential gas turbine applications, to evaluate the emissions performance and stability of several fuel nozzles for Humidified Air Turbine (HAT) cycle applications, and to evaluate the potential of a Rich-Quench-Lean Trapped Vortex combustor (RQL/TVC) for use with fuels containing fuel-bound nitrogen.

Opportunities

Utilize NETL Advanced Combustion Facility capabilities (P, T, Mass Flows)



Refractory-lined test modules with multiple ports for temperature and pressure measurement as well as optical diagnostics

